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09/512,262	02/24/2000	Hiroaki Sudo	JEL 31024	5961

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2666	

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/512,262	Applicant(s) SUDO, HIROAKI	
	Examiner Melanie Jagannathan	Art Unit 2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-21* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4,6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: on line 2, "receives" should be changed to "receiving". Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 8-9, 12-21 rejected under 35 U.S.C. 102(e) as being anticipated by Seki et al. US 5771,224.

Regarding claims 1-3, 12-13, 15, 17-19, the claimed OFDM transmission apparatus for use in mobile communication system comprising multiplier for multiplying same important information used for communication control by at least two carrier frequency signals to generate an OFDM signal and transmitter is disclosed by OFDM frame (Figure 2) with null symbol, sine sweep symbol and reference symbol for timing synchronization and equalization reference and OFDM transmitter (Figure 3) with multiplexer (element 11) which multiplexes individual inputs to produce transmission frame. See column 7, lines 22-43, column 8, and lines 13-47.

Regarding claims 4-5, 14, 16, 20-21, the claimed OFDM reception apparatus, comprising receiver for use in mobile communication system, receiving OFDM signal and extractor to extract important information from reception signal is disclosed by OFDM receiver (Figure 4) with frequency converter, and A/D converter, demultiplexer to remove null and reference symbols. See column 9, lines 8-18 and column 10. The claimed determiner for comparing the reception level of subcarriers by which important information is multiplied and determining the important information carried by subcarrier with higher reception level as the important information is disclosed by reference symbol error detector (element 28) where a comparison is made between received reference symbols and reference symbol generator (element 29) to detect errors of each carrier to send to equalizer and also a QPSK symbol error detector (element 32) to detect offsets of each QPSK information symbol from output from equalizer and a correction circuit corrects any error. See column 10.

Regarding claim 6, the claimed averaging of reception level of first subcarrier and second subcarrier is disclosed by OFDM receiver with QPSK error detector (Figure 10, element 61) to detect phase variations and these are fed into averaging circuit (element 62). See column 14, lines 16-45.

Regarding claim 8, the claimed determiner compares the determination error of first subcarrier and the determination error of second subcarrier and determines the important information carried by subcarrier with small determination error as important information is disclosed by reference symbol error detector (element 28) where a comparison is made between received reference symbols and reference symbol generator (element 29) to detect errors of each carrier to send to equalizer and also a QPSK symbol

error detector (element 32) to detect offsets of each QPSK information symbol from output from equalizer and a correction circuit corrects any error.

Regarding claim 9, the claimed DC offset detector for adding up reception signals of first subcarrier subjected to Fourier transform processing for every unit time and averaging reception signals to detect DC offset is disclosed by OFDM receiver with QPSK error detector (Figure 10, element 61) to detect phase variations and these are fed into averaging circuit (element 62). See column 14, lines 16-45. The claimed storer for storing detected DC offset and subtractor for subtracting DC offset read from storer from reception signal is disclosed by complex data representing amplitude and phase of each carrier after FFT operation on effective symbol portion entered into memory (element 27) and equalizer. See column 9, lines 39-65.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al. in view of Vook et al. US 5,982,327.

Seki et al. disclose all of the limitations except for combiner for maximum ratio combiner for carrying out weighting processing on the first and second subcarriers. Vook et al. disclose combiner in OFDM system using a weighting process on OFDM symbols. See column 9, lines 21-67, column 11, lines 61-67, and column 12. At the time the invention was made it would have been obvious to a person of ordinary skill in the art to modify Seki et al. with combiner of Vook et al. One of ordinary skill in the art would be motivated to do so to reduce detect variations in carrier to reduce error and improve performance. See column 2, lines 1-22.

Allowable Subject Matter

6. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Prior art of record does not disclose, in single or in combination, determiner with first determiner for comparing reception level of first and second subcarriers, second determiner for determining whether difference in reception level between first and second subcarriers is larger or smaller than a predetermined value, determiner determines important information carried by second subcarrier as important information if difference is smaller than predetermined value.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Seki et al. US 5,694,389 disclose OFDM transmission/reception system.

Takahashi et al. US 5,732,068 disclose signal transmitting and signal receiving apparatus using OFDM.

Mueller US 5,617,411 discloses method for digital data transmission in the zero symbol of COFDM modulation method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Jagannathan whose telephone number is 703-305-8078. The examiner can normally be reached on Monday-Friday from 8:00 a.m.-4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melanie Jagannathan
Patent Examiner
AU 2666

MJ

FRANK DUONG
PRIMARY EXAMINER